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DISEASE AND INJURY AMONG FOSSIL MEN AND THE BEGINNINGS OF SURGERY

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THE remains of ancient stone age man occasionally show evidences of disease and injury. These evidences among the neolithic and paleolithic races of western Europe have been studied by Raymond and LeBaron, and mention of sundry other lesions is to be found in the writings of Keith, Manouvrier, Ruffer, Baudouin and other students of anthropology. These studies are based on remains of human races found in western Europe, since no representatives of the stone age men, as they are called, have been found in the western Hemisphere. The remains of these early races are scanty, and many of the skeletal elements are normal. Some few, however, give us an insight, because of their pathological conditions, into the possible cause of their pathology and the necessity of the introduction of surgery to care for these injuries. Trephining, itself a traumatism, was introduced quite early among ancient man, as were finger amputation, cauterization and possibly scarification. These phases of primitive surgery have already been discussed in previous contributions and it remains to point out the original need for surgery, the factors underlying its development, as well as the data on which these conclusions are based.

Man's oldest representative, or man's precursor, is identified in the oldest well-authenticated skeletal manlike remains found in 1891 by Dr. E. Dubois, at that time a surgeon in the Dutch Army, stationed in Java. In the leisure of his station he had undertaken paleontological excavations along the banks of the Bengavan River, near Trinil, in the central part of the island of Java. He found, quite widely scattered, a calvarium, some teeth, a portion of a jaw and a left femur entire. These important remains were described by Dubois in a finely illustrated quarto issued at Batavia in 1894. His work was immediately received as one of the greatest contributions to the study of the antiquity of man. Although a very extensive literature has developed concerning the antiquity of man, this discovery still ranks as the most marvelous revelation of man's ancestry so far known. The interest to us in this curious ape-like form is that the femur shows

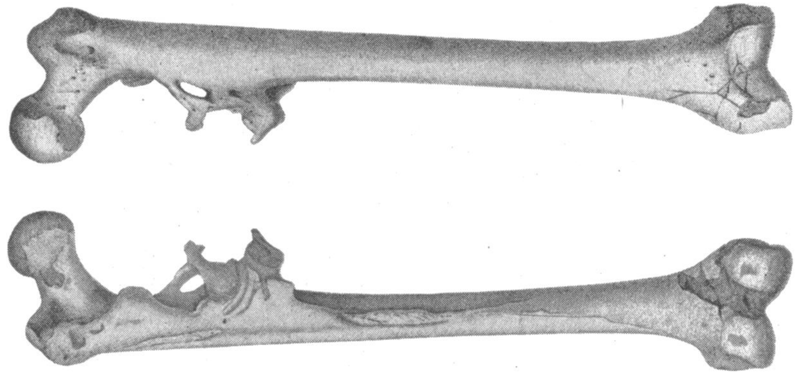

FIGURE 1

Anterior view of the left femur of the oldest known human representative, *Pithecanthropus erectus,* portions of whose skeleton, 500,000 years old, were found in 1891 in a river deposit in Java. The femur shows an extensive medial exostosis due to some chronic infection or other irritation along the line of the tendinous attachment of the iliopsoas and pectineus muscles. This is the oldest example of human pathology.

Posterior view. After Dubois.

marked exostoses (Figure 1) indicating the presence of a pathological condition of great severity. This is the oldest evidence of pathology in a humanoid form.

On account of the very great interest attached to such a discovery the pathology has been widely discussed. The great pathologist Virchow, who was also an eminent student of anthropology, called attention to the similarity of the medial exostoses on the femur of the ancient form to those seen in modern femora. He exhibited a number of these which he had selected from the collections of the Berlin Pathological Institute (Figure 2).

The next oldest known form representing man is that designated Eoanthropus, meaning the dawn man. Sir Auckland Geddes, after an examination of these Piltdown remains, decided that this ancient Englishman, who lived and died thousands of years ago, had suffered a pathological alteration of the bones of the skull. He based his conclusions on the remarkable thickness, coupled with

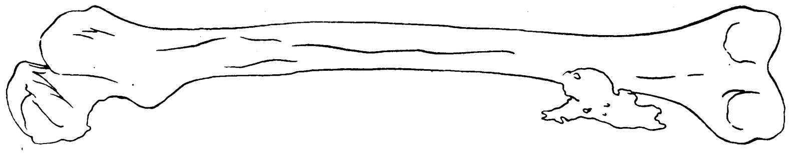

FIGURE 2

Modern human femur showing medial exostoses similar to those exhibited by the *Pithecanthropus.* These drawings were used by Virchow to demonstrate to the anthropological society of Berlin that the pathology of the most ancient man-like form was similar to modern pathology. Some scholars had argued that the femur was not human, being misled by the pathological deformation.

the characteristic outline of the temporal ridge, which can only find their diagnosis in Acromegaly. He fails, however, to differentiate this condition from Paget's disease which produces a similar pathology. It is possibly due to this factor that the remains were preserved. Thus it is seen that the oldest representatives of man had suffered from disease. Where there is a disease or injury even among wild animals, there is always some instinctive, though primitive, means of healing. While from the actual evidences nothing whatever is known of the state of surgery during the most ancient periods of man's development, may we not safely surmise that these primitive ape-like humans pondered in a vague way, over the means of curing disease and injury and thus laid a foundation for the development of that knowledge of surgery which we see emerging from the darkness in the late Paleolithic and early Neolithic races thousands of years later? An instinctive licking of an injury is the forerunner of antiseptic appliances, or the sucking of pus wounds. Quietness and seclusion after fracturing a limb was the instinctive act preceding the use of bark, skin, or hardened clay splints.

The most famous of the skeletal remains representing men of the old stone age, when surgery had its first recorded existence, are the portions of a skeleton of an extinct species of man found in a cave in the valley of the Neander River, in the Rhine province of Prussia, hence the individual is known as the Neanderthal man. The proximal end of the left ulna had evidently been fractured (Figure 3) since there is a marked widening of the articular fossa. The left humerus also shows signs of injury in consequence of which it doubtless remained much weaker than the right bone. Virchow thought that the condition of the bones of this ancient man indicated *rickets*. If so this would be the oldest evidence of rickets in man, but Schwalbe restudied the question and decided that there was no evidence of malnutrition and his conclusions are widely accepted.

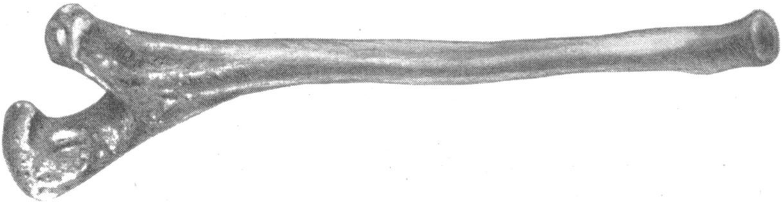

FIGURE 3

Left ulna of an ancient man, known as the *Neanderthal man*, whose skeleton, found in a cave in the valley of the Neander river of Europe, has aroused considerable interest on account of the primitive human characters which it exhibits. This skeleton, which is about 75,000 years old, shows evidences of injury in the divaricate olecranon, possibly due to a severe blow on the elbow producing a fracture. Drawn from a photograph of the original by Hrdlička.

One of the most interesting cases of ancient injury which has come down to us is a specimen of a lumbar vertebra of a late stone age man, showing an arrowpoint deeply embedded in the visceral surface. Older injuries of a similar nature teach us that ancient man was liable to such inflictions incident to war and the chase. During this period wounds made by blows from stone hatchets, arrow and spear points are fairly common. Many of these injuries as shown on the remains found in the ancient sepultures show evidences of long standing and final healing, thus pointing, indistinctly to be sure, to some preventive measures being taken. LeBaron from his study of ancient human skeletons arrived at the conclusions that early man reduced and fixed fractures with great perfection, evidenced by the great numbers of well-healed fractures. Among 18 cases he examined only 3 had healed badly.

Nearly all types of fractures are found among the remains of ancient man. The frequency of spondylitis deformans is striking. Pott's disease was occasionally observed. Alteration of skulls due to ulcerations; scoliosis; various hyperostoses; caries of bone and teeth; atrophy of the skull; exostoses and osteomata and many varieties of arthritides indicate to us the variety of afflictions to which early man was subject. It is no wonder that, with this array of pathology to contend with, early man saw the necessity of dealing with them. While many of the earliest recorded evidences of surgery were developed as a phase of religious procedures, there must have been many therapeutic measures known to them which have not been recorded but whose presence we may infer from the pathological evidences of their skeletal remains. Surgery then in its earliest beginnings was derived from three sources: (1). Instinctive acts after injury or during the progress of a disease; (2). Surgical operations on the body which though developed in connection with religious practices often had therapeutic results; (3). Voluntary mutilations, practiced apparently since the earliest dawn of humanity. This was the condition of pathology and surgery among those man-like creatures of the hills and forest from whom the modern human races have slowly evolved.